

Wateraccumulatie

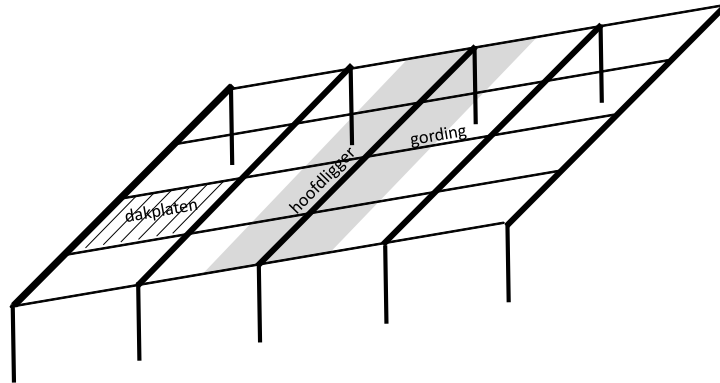
Wat en Hoe ...

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Wateraccumulatie

- 3D-systeem van hoofdligger, gording, dakplaat.
- Waarom lastiger dan sneeuw.
- Vervorming door permanente belasting.
 - Wel zeeg / Geen zeeg
- Eenvoudig model.
 - Zonder afschot / Met afschot
- Hoe **XFEM4U** de constructeur ontzorgt.

3D-daksysteem

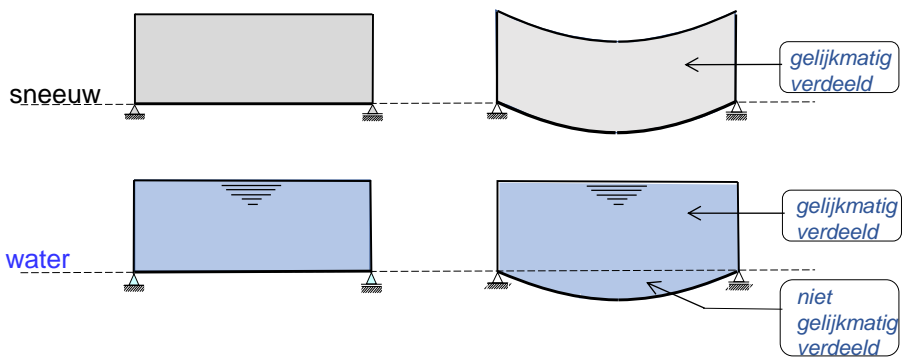


 Struct4U

All together in control

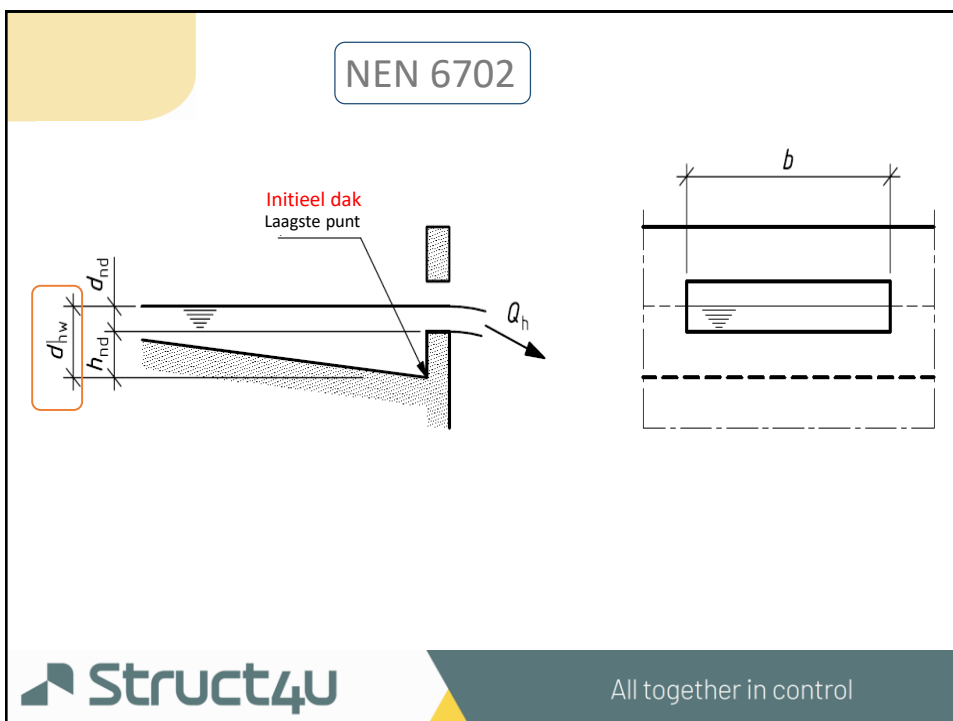
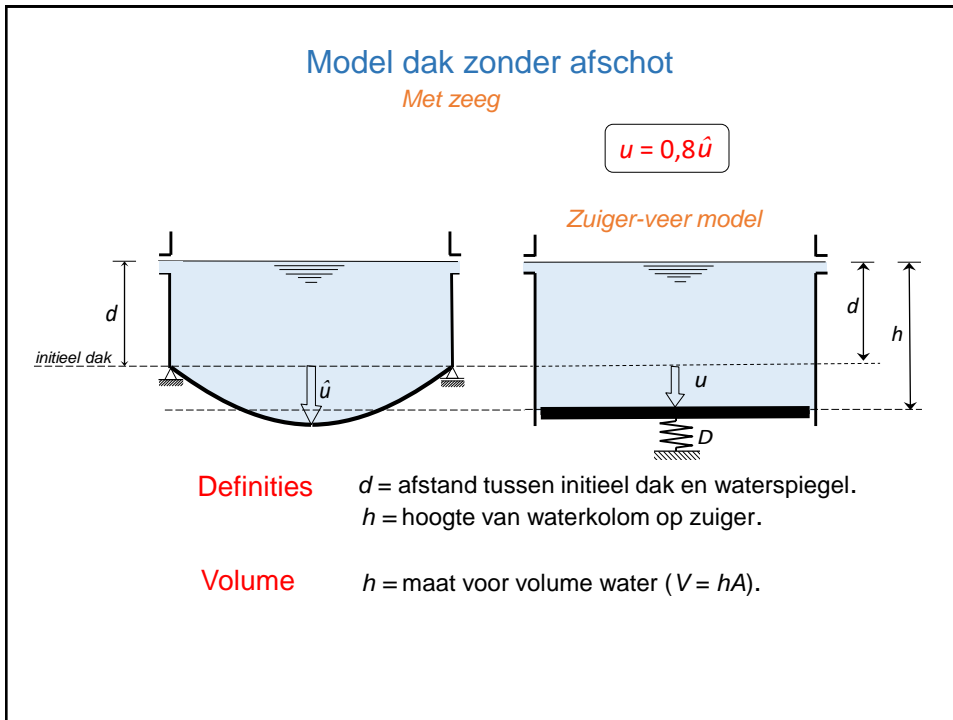
Wateraccumulatie

Wat er anders gaat ...

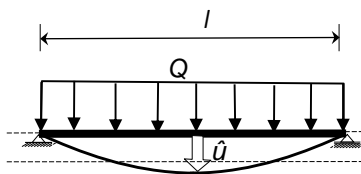
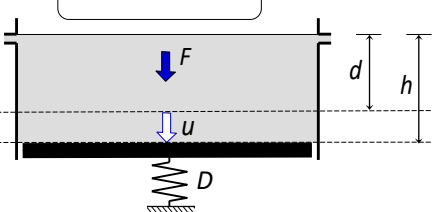


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Veerstijfheid

$u = F/D$

Liggertheorie

$$\hat{u} = \frac{5}{384} \frac{Ql^4}{EI} \rightarrow u = Ql \cdot \frac{l^3}{96EI} \rightarrow u = F \cdot \frac{1}{D} \rightarrow D = 96 \frac{EI}{l^3}$$



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Relatie van d en h

$D = 96 \frac{EI}{l^3}$ Veerstijfheid [kN/m]

$W = \gamma_w A$ Watergewicht/m [kN/m]

stijfheidsfactor

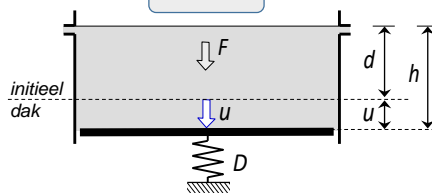
$n = D/W$


veer

$F = Du \rightarrow (d+u)W = Du \rightarrow d+u = nu \rightarrow d = (n-1)u$

$u = \frac{1}{n-1}d \rightarrow h = \left(1 + \frac{1}{n-1}\right)d \rightarrow h = \frac{n}{n-1}d$

$F = hW$

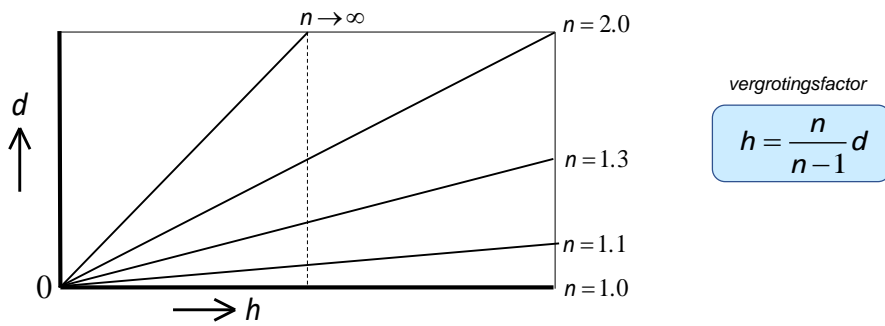




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Zuiger-veer model

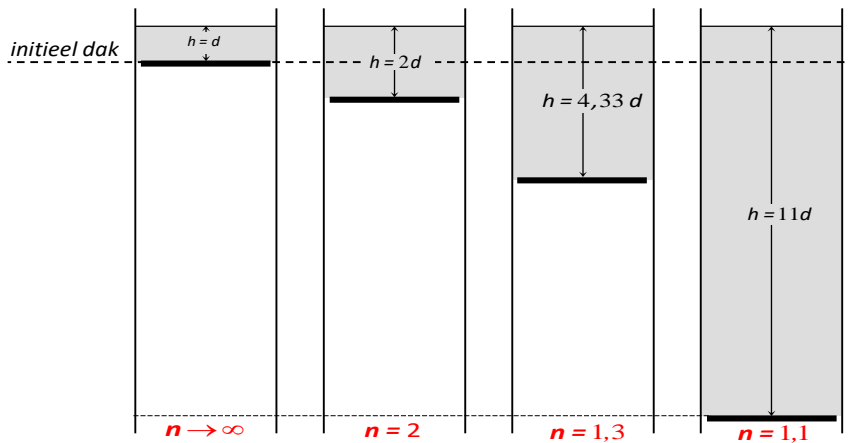
Grafische weergave



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Zelfde waterstand d , andere waterkolom h .

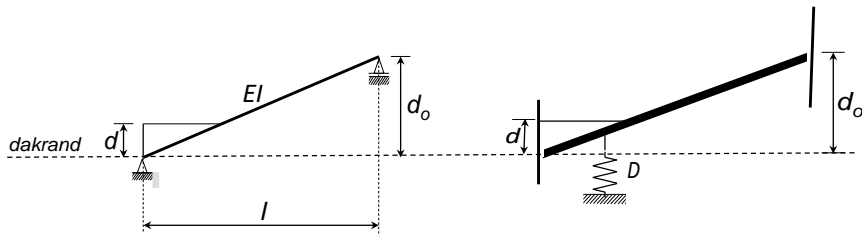


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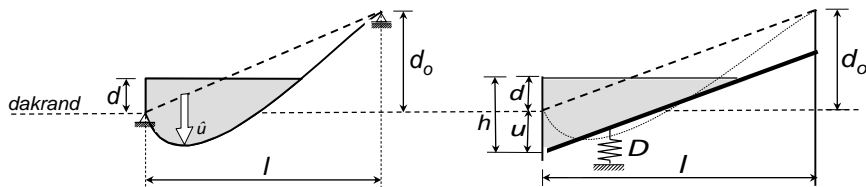
Model dak met afschot

Met zeeg



Model dak met afschot

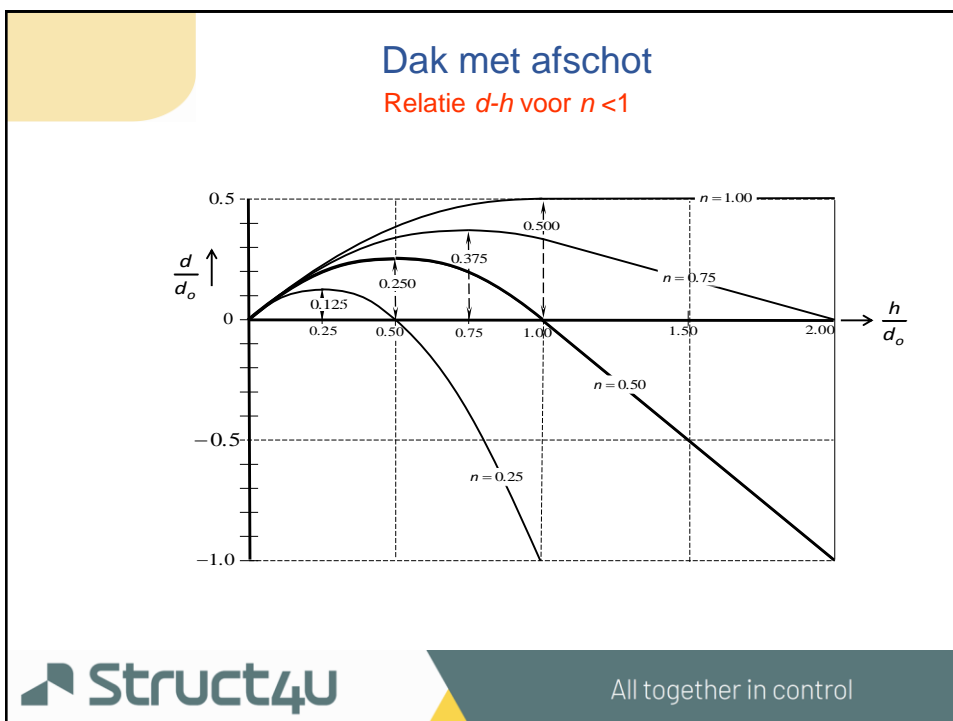
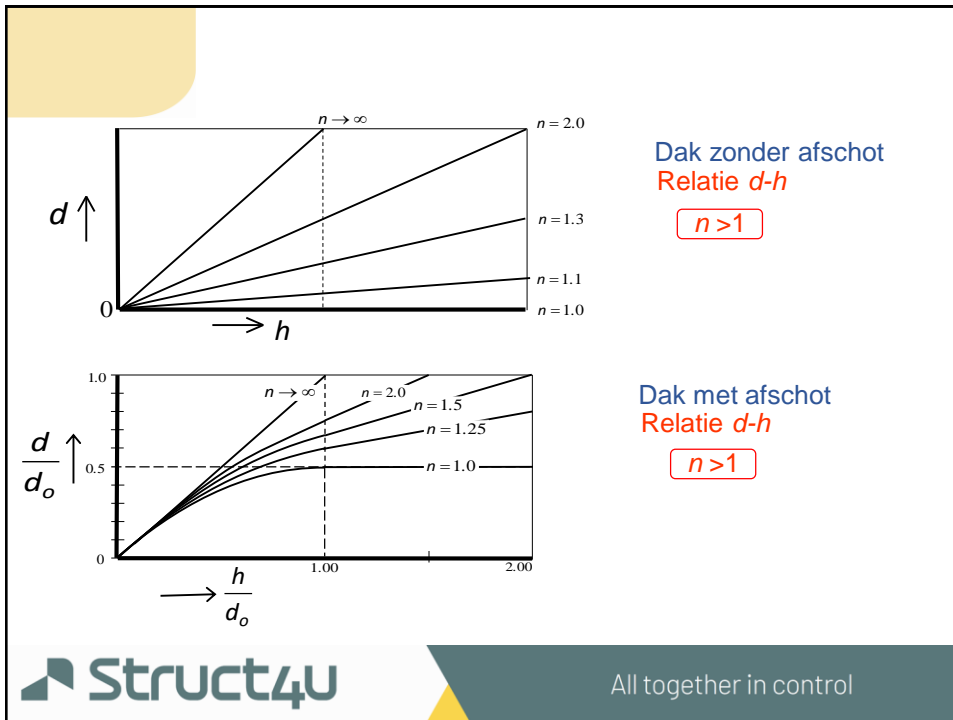
Zuiger evenwijdig aan dak

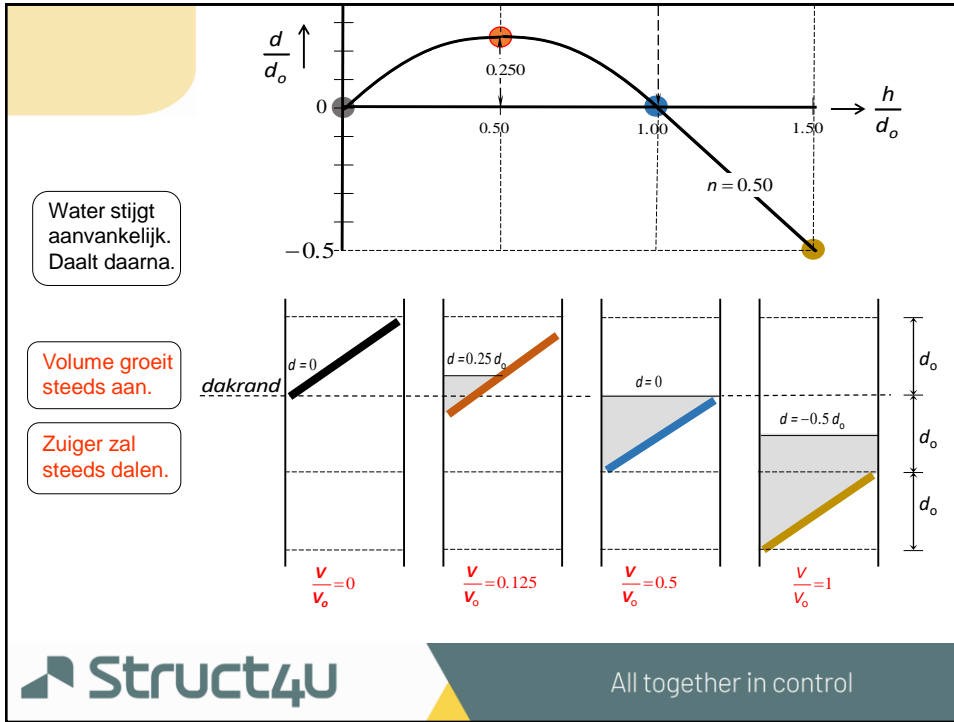


Definities

d = afstand tussen *dakrand* en waterspiegel.

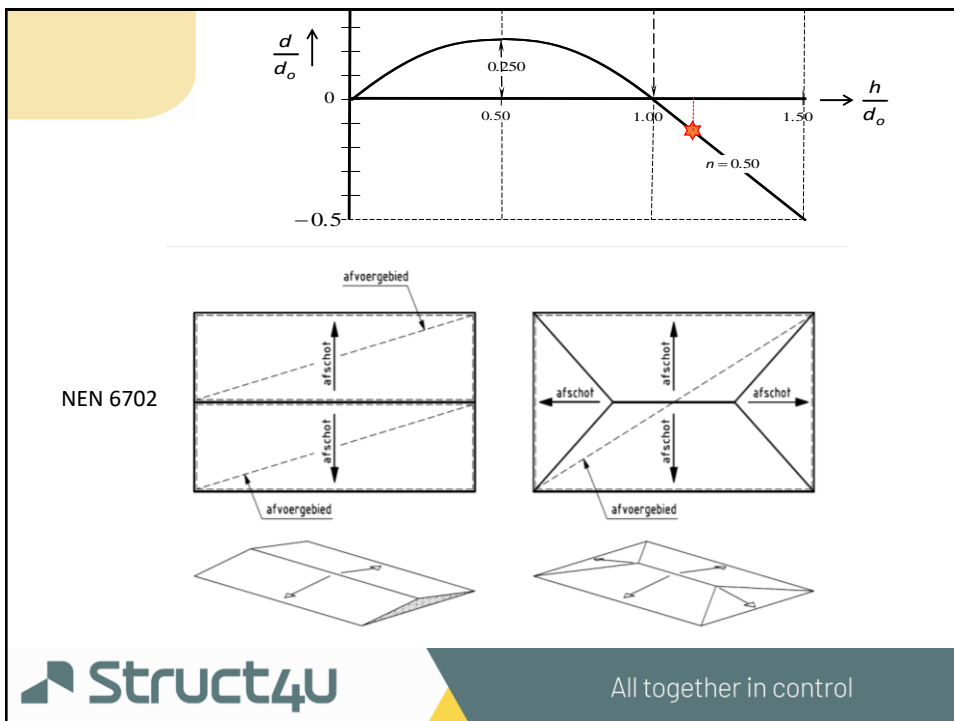
h = hoogte van waterkolom *bij dakrand*.





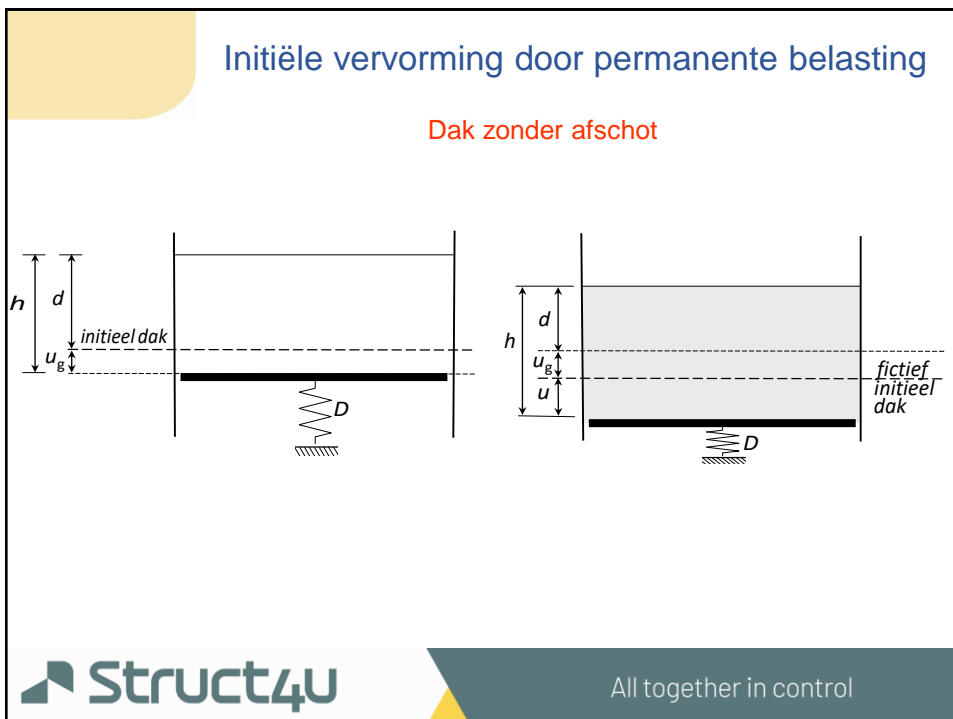
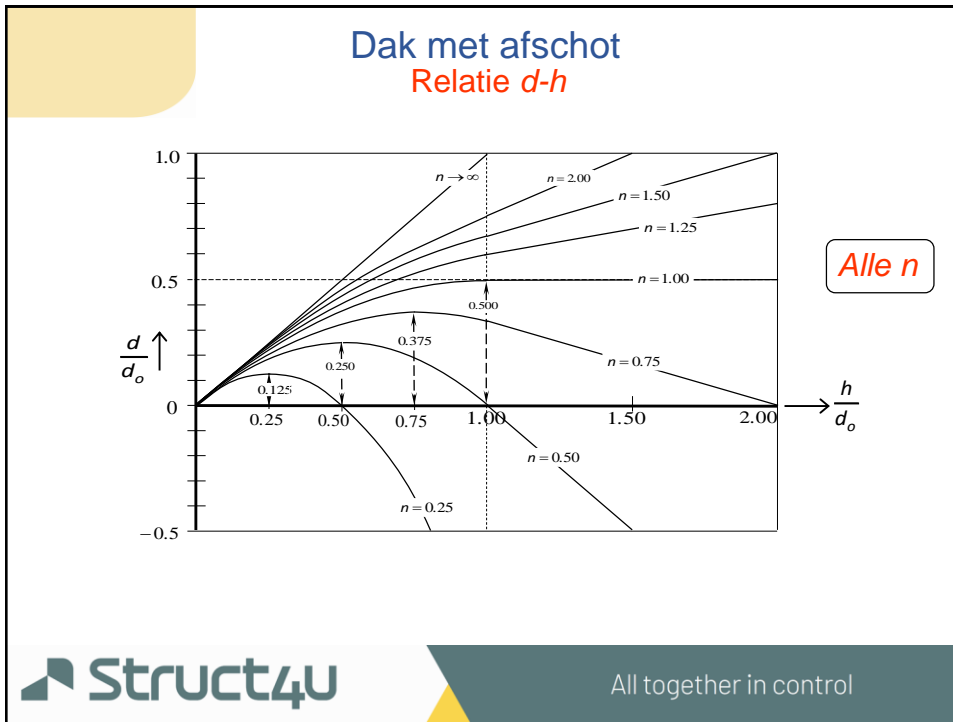
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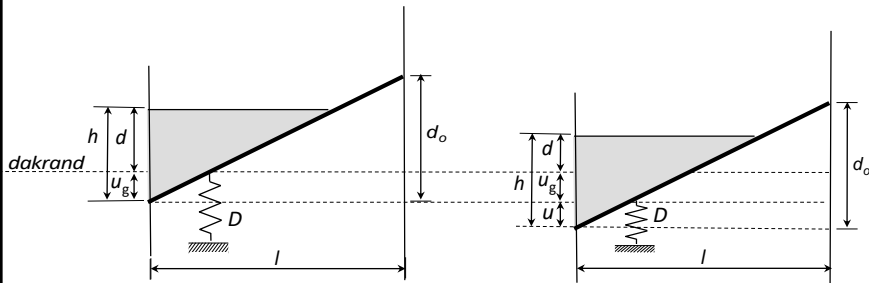
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Initiële vervorming door permanente belasting

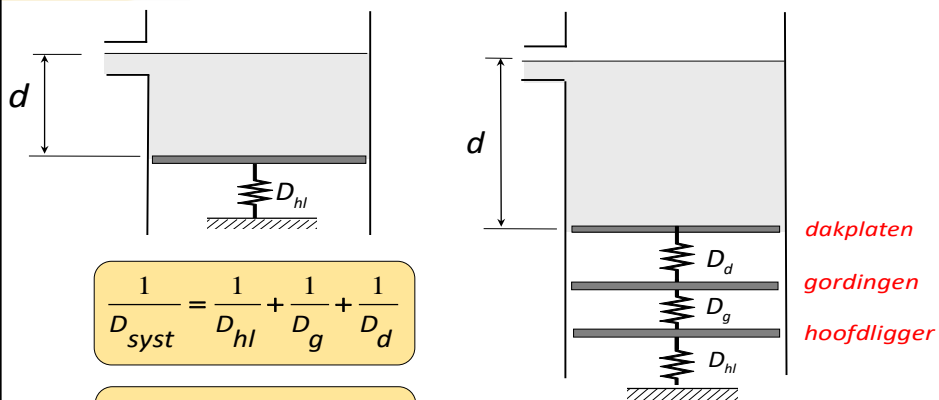
Dak met afschot



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3D-systeem



$$\frac{1}{D_{syst}} = \frac{1}{D_{hl}} + \frac{1}{D_g} + \frac{1}{D_d}$$

$$\frac{1}{n_{syst}} = \frac{1}{n_{hl}} + \frac{1}{n_g} + \frac{1}{n_d}$$

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XFEM4U ontzorgt

Altijd d - V curve

Kennis van n niet nodig

